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EVALUATION OF SOUTHERN PINE BEETLE INFESTATIONS ON THE  
BLUE RIDGE PARKWAY, NORTH CAROLINA

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INTRODUCTION

An outbreak of the southern pine beetle, *Dendroctonus frontalis* Zimm., is occurring throughout the southern Appalachian Mountains of western North Carolina. Included in the outbreak area is a 30-mile section of the Blue Ridge Parkway which is administered by the U. S. Department of the Interior, National Park Service. This section is located between Mount Pisgah and Mount Mitchell near Asheville, N. C. (Figure 1).

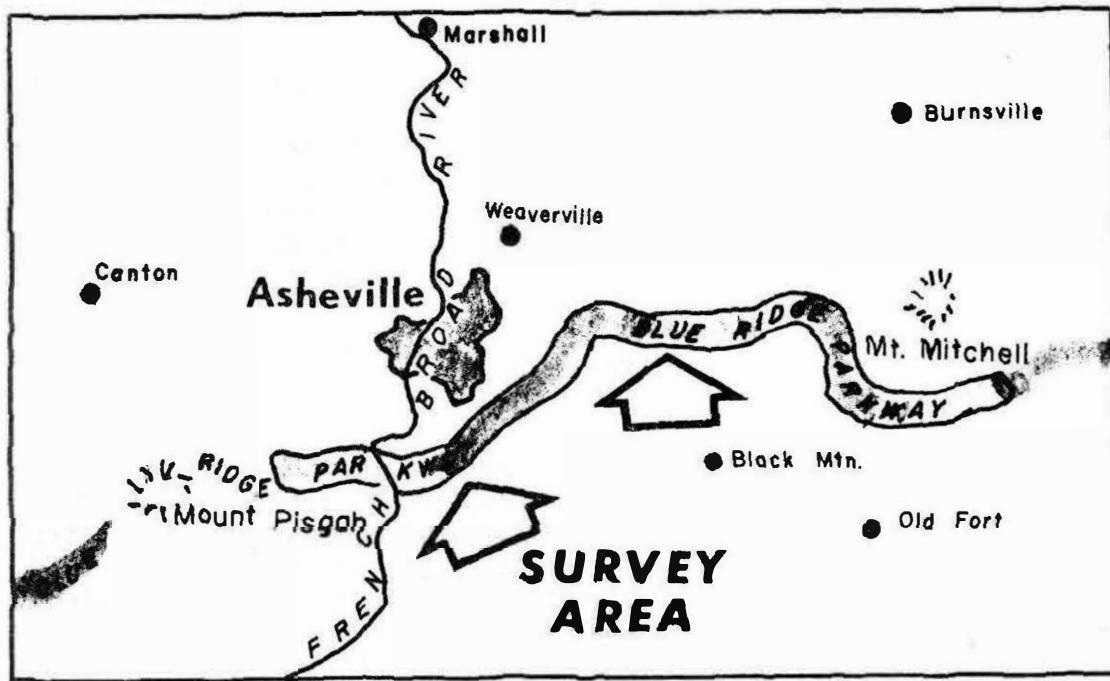


Figure 1. Location of southern pine beetle evaluation on Blue Ridge Parkway, National Park Service, Asheville, N. C.

Outbreaks of the southern pine beetle have been recorded periodically in the southern Appalachian Mountains since the early 1800's. The last outbreak in the current survey area occurred in the mid-1950's. Generally an outbreak lasts about two or three years in the mountains and is usually controlled by a combination of severe winter weather and the beetles' natural enemies.

This current evaluation was conducted by the U. S. Forest Service, Forest Pest Management office at Asheville, N. C. The purpose of the evaluation was to determine the current status and trend of the southern pine beetle outbreak on the Blue Ridge Parkway.

#### TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis* Zimm.

Hosts - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

Type of damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate or change to adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as four or five generations may be produced annually in this area.

#### METHODS

A 100 percent aerial photographic survey was conducted in evaluating the southern pine beetle outbreak on the Blue Ridge Parkway (Figure 1). Standard aerial and ground techniques were utilized in the evaluation.<sup>1/</sup> Eight spots of red and fading pine trees were examined on the ground survey to determine the cause of mortality, number of beetle-killed trees, and the condition of bark beetle brood. Bark samples were obtained from infested trees and radiographed to determine brood density.

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<sup>1/</sup> Evaluating Southern Pine Beetle Infestations, 1970. U.S.D.A., U.S.F.S., SA, S&PF, Div. of FPM, Pub. FPM-8, Atlanta, Ga. 35 pp.

## RESULTS AND DISCUSSION

The southern pine beetle population is currently at a high level on the Blue Ridge Parkway and adjoining lands near Asheville, N. C. Results of this evaluation showed approximately 5,000 trees killed by the beetle on the Parkway (Table 1). Three thousand five hundred of these trees were actively infested at the time of the ground survey which indicates that there is a high potential for additional activity during the coming spring and summer. Individual trees sampled on the ground survey showed an average of 305 beetles per square foot of bark surface emerging from the infested trees. The brood appeared healthy and capable of starting new infestations.

Table 1. Summary of the results of southern pine beetle evaluation conducted on the Blue Ridge Parkway, Asheville, N. C., 1974.

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1. Results compiled from data collected during the aerial phase of the evaluation:

Survey type . . . . .	Photo
Date of survey. . . . .	9/23/74
Total acreage surveyed. . . . .	2,000
Total susceptible host type . . . . .	150
Total number of spots within the survey boundary. . . . .	15
Average spot size (trees) . . . . .	322
Range of spot sizes (trees) . . . . .	15-1500

2. Results compiled from data collected during the ground and aerial phases of the evaluation:

Date of ground phase. . . . .	11/13/74
Total number of affected trees. . . . .	5,121
Percent of spots active . . . . .	100%

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Infestations were found throughout the survey area but were concentrated between Oteen and where Highway 25 intersects the Blue Ridge Parkway. Almost all of the infestations checked occurred in overstocked pine stands or had started in dense overstocked stands. Few attacked trees were observed in hardwood stands with scattered pine. Infestations were found in a variety of situations, such as at scenic overlooks, residential areas, and at a number of locations along the Parkway (Figure 2). Beetles were also found attacking the virgin spruce stand in the Mount Mitchell area of the Parkway.



Figure 2. Trees killed by the southern pine beetle along the Blue Ridge Parkway. Pines on both sides of Parkway are dead.

#### CONCLUSIONS

As pointed out in the discussion of this report, southern pine beetle activity is expected to continue on the Blue Ridge Parkway during 1975. The decision regarding the need for suppression will be made by the managers of the Parkway. Some of the factors to consider in making this decision include:

1. Availability of a suitable suppression method.
2. Impact of damage to aesthetic value along Parkway and in residential areas.
3. Impact of suppression measures to the ecology of the area.
4. Safety and fire hazard caused by the deteriorating beetle-killed trees.
5. Threat of beetles spreading from spots on Park Service lands to adjoining private lands.

Although tree losses can be reduced through a suppression program, there is little chance of eliminating the beetle population from the area.

Even if the Blue Ridge Parkway suppresses all southern pine beetle infestation on the Parkway, there will probably be additional infestation because of reinfestation by beetles from adjoining lands.

There are currently three direct methods of suppressing southern pine beetles recommended by the U.S.D.A. Forest Service. The first method, which is also the most desirable, is to remove the infested trees. (Figure 3.) This can be accomplished by commercial sale of the infested trees or by hiring a contractor to remove the infestations. The other two methods are to pile and burn the infested trees or cut and spray the infested trees with a 1/2 percent solution of lindane. This chemical is approved by the U.S.D.A. for control of the southern pine beetle, but it is currently on the restricted use list of the National Park Service.



Figure 3. An area along the Parkway where a southern pine beetle infestation was removed.

These methods will not guarantee that the pine stands will not be re-attacked but they will stop the spread of individual infestations if done properly. Specific details for using any of these methods are available from the U. S. Forest Service, Forest Pest Management Office in Asheville, N. C.